

WHAT IS CLAIMED IS:

1. A projection type image display apparatus, comprising:
an electroluminescence element having a plurality of pixels that can be individually modulated, in which the modulating pixels which generate and emit light by means of recombination of excitons formed by injecting electron charge carriers into a luminescent layer are two-dimensionally arranged,

a projection optical system which projects light emitted from the individual modulated pixels of the electroluminescence element,

a controller which generates drive signals to control the emission amount of the electroluminescence element, wherein

an electroluminescence material used for the luminescent layer is a phosphorescent material which emits phosphorescence by priority, which is emitted from an excited triplet state, and

the controller superimposes intermittent turning-on signals with predetermined cycles on emission amount modulating signals which modulate current values to be injected into the pixels according to display image signals.

2. The projection type image display apparatus according

to Claim 1, wherein the electroluminescence element is structured by repeated matrix arrangement of pixels which emit light in three primary colors, and display additive color images.

3. The projection type image display apparatus according to Claim 1, comprising:

three electroluminescence elements each of which emits light in one color different from each other among three primary colors, and

a wavelength-combining optical member having dichroic waveband separating films which combine light emitted from the three electroluminescence elements, wherein

light combined by the wavelength-combining optical member is projected by the projecting optical system to display additive color images.

4. The projection type image display apparatus according to Claim 1, wherein

in the delaying emission characteristics of the electroluminescence element having the phosphorescent material in its luminescent layer, the time of half attenuation of emission intensity from a peak emission time is shorter than one millisecond.

5. The projection type image display apparatus according to Claim 4, wherein

the turning-off time of the intermittent turning-on signal in one cycle is shorter than the time to half-attenuation the emission intensity from a peak emission time in the delaying emission characteristics of the electroluminescence element using the phosphorescent material for its luminescent layer.

6. The projection type image display apparatus according to Claim 1, wherein

the intermittent turning-on signal has a turning-on time and a turning-off time equal to each other in one cycle, and

the controller inverts the timing phase of turning-on and turning-off of the pixels handling emission in two out of three primary colors, corresponding to the inversion of the π phase, respectively, in the electroluminescence element.

7. The projection type image display apparatus according to Claim 1, wherein

the turning-on time and the turning-off time of the intermittent turning-on signal have a time ratio of 1 to 2, and

the controller delays the timing phases of turning-on and turning-off of pixels handling emission in three primary colors, respectively, in the electroluminescence element by $2/3\pi$ to each other.

8. The projection type image display apparatus according to Claim 1, wherein

the turning-on time and the turning-off time in the intermittent turning-on signal has a time ratio of 2 to 1, and

timing phases of turning-on and turning-off of the pixels handling emission in three primary colors, respectively, are delayed by $2/3\pi$ to each other.

9. An image display system, comprising:

a projection type image display apparatus according to Claim 1, and

a screen onto which images are projected by the projection type image display apparatus, wherein

an image projected on the screen is recognized by an observer by means of diffused light that has been reflected by the screen and has predetermined directivity.

10. An image display system, comprising:

a projection type image display apparatus according to

Claim 1, and

a screen onto which images are projected by the projection type image display apparatus, wherein

an image projected on the screen is recognized by an observer by means of diffused light that has been transmitted through the screen and has predetermined directivity.

11. A projection type image display apparatus, comprising:

an electroluminescence element having pixels that can be individually modulated, where a luminescent layer of the electroluminescence element is formed of a material containing an organic fluorescent material or an organic phosphorescent material,

a projection optical system which projects modulated light emitted from the respective pixels of the electroluminescence element,

an element temperature detector which detects the temperature of the electroluminescence element,

an outside air temperature detector which detects the outside air temperature,

a cooling unit provided on a surface other than a light emitting surface of the electroluminescence element, and

a controller which controls the cooling unit so that a temperature detected by the element temperature detector

becomes equal to or lower than a temperature detected by the outside air temperature detector and the difference from the temperature detected by the outside air temperature falls within a predetermined range.

12. The projection type image display apparatus according to Claim 11, wherein

the controller controls the cooling unit from the time of power supply to this projection type image display apparatus so that a difference between a temperature detected by the element temperature detector and a temperature detected by the outside air temperature detector falls within the predetermined range at a predetermined temporal gradient.

13. The projection type image display apparatus according to Claim 11, wherein

the cooling unit comprises a Peltier element.

14. The projection type image display apparatus according to Claim 11, wherein

at the light emitting surface side of the electroluminescence element, at least two light transmitting windows are provided so that a gas layer is sealed between these.

15. An image display system, comprising:

a projection type image display apparatus according to
Claim 11, and

a screen onto which images are projected by the
projection type image display apparatus, wherein

an image projected on the screen is recognized by an
observer by means of diffused light that has been reflected
by the screen and has predetermined directivity.

16. An image display system, comprising:

a projection type image display apparatus according to
Claim 11, and

a screen onto which images are projected by the
projection type image display apparatus, wherein

an image projected on the screen is recognized by an
observer by means of diffused light that has been
transmitted through the screen and has predetermined
directivity.

17. A projection type image display apparatus, comprising:

an electroluminescence element having a plurality of
pixels including pixels for red, green, and blue, and

a projection optical system which projects light from
the electroluminescence element onto a predetermined surface,

wherein

at least pixels which emit light in one color of red, green, and blue carry out emission by using an inorganic electroluminescence material.

18. An image display system, comprising:

a projection type image display apparatus according to Claim 17, and

a screen onto which images are projected by the projection type image display apparatus, wherein

an image projected on the screen is recognized by an observer by means of diffused light that has been reflected by the screen and has predetermined directivity.

19. An image display system, comprising:

a projection type image display apparatus according to Claim 17, and

a screen onto which images are projected by the projection type image display apparatus, wherein

an image projected on the screen is recognized by an observer by means of diffused light that has been transmitted through the screen and has predetermined directivity.